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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/743,271 | 12/23/2003 | Helmar Van Santen | 081468-0307331 | 4441 |
| 909 | 7590 | 01/03/2006 | EXAMINER | |
| PILLSBURY WINTHROP SHAW PITTMAN, LLP | | | | NGUYEN, HUNG |
| P.O. BOX 10500 | | | | ART UNIT |
| MCLEAN, VA 22102 | | | | PAPER NUMBER |
| | | | | 2851 |

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|----------------------|-------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/743,271 | VAN SANTEN ET AL. |
| | Examiner | Art Unit |
| | Hung Henry V. Nguyen | 2851 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 November 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,3-13,15-25 and 27-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 1,3-13 and 15-20 is/are allowed.
- 6) Claim(s) 21-25 and 27-36 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 November 2005 is/are: a) accepted or b) objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 27, the alternative recitation of “inlet port is connected to a base frame that support the substrate table, or a projection frame that supports the projection system or both” renders the claim indefinite since if the inlet port is connected to the projection frame as recited in claim 27, it is not understood how the inlet port can be mechanically isolated from the projection system” as recited in claim 1.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an

international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 21-22, 24, 30-31, 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizutani et al (US 2005/0264774 A1).

With respect to claims 21-22, 24, and 30-31, Mizutani et al discloses an immersion lithographic projection apparatus comprising all of the limitations of the instant claims such as: an illumination system (IL) configured to provide a beam of radiation; a support structure (MST) configured to hold a patterning device (M), the patterning device configured to impart the beam with a pattern in its cross-section; a substrate table (PST) configured to hold a substrate (P); a projection optical system (PL) configured to project the patterned beam onto a target portion of the substrate; a liquid system (1,2) configured to provide an immersion liquid to a space between the substrate and the projection system, the liquid supply system having at least one immersion liquid inlet port (4) not provided on the substrate table and wherein an at least one immersion liquid outlet port (4) is “suspended above” the substrate and is radially outwardly of the at least one immersion liquid inlet port (see figure 1), and the inlet port is mechanically isolated from the projection optical system and the immersion liquid is not substantially confined in the space so that the liquid can flow out of the space.

As to claim 33, Mizutani et al discloses the liquid inlet port (4) is separated and mechanically isolated from the projection system.

5. Claims 30-31, 33, 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Vogel et al (U.S.Pat. 6,867,844).

With respect to claim 30, Vogel et al discloses an immersion lithographic projection apparatus comprising all of the limitations of the instant claims such as: an illumination system (see col.7, lines 45-50) configured to provide a beam of radiation; a support structure configured to hold a patterning device, the patterning device configured to impart the beam with a pattern in its cross-section; a substrate table configured to hold a substrate (101); a projection optical system (102) configured to project the patterned beam onto a target portion of the substrate; a liquid system configured to provide an immersion liquid (LQ) to a space between the substrate and the projection system, the liquid supply system having at least one immersion liquid inlet port (105A) not provided on the substrate table and wherein an at least one immersion liquid outlet port (105A) is suspended above the substrate (see figures 1 and 4).

As to claim 31, Vogel et al teaches at least one immersion liquid outlet port is radially outwardly of the at least one immersion liquid inlet port.

As to claim 33, Vogel et al disclose the liquid inlet port (105) is mounted on the housing (103) and is mechanically isolated from the projection system.

As to claim 34, Vogel teaches the at least one immersion liquid inlet port being connected to a projection system frame (103) that supports the projection systems.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 25, 28-29, 32, 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani et al (US 2005/0264774 A1).

With respect to claims 28-29, and 35-36, Mizutani et al discloses an immersion lithographic projection apparatus comprising substantially all of the limitations of the instant claim as discussed. Mizutani et al et al does not expressly disclose an actuator configured to adjust at least of the height and tilt of the barrier member relative to the object. Schuster et al teach an actuator configured to adjust at least the height and tilt of barrier member (9) relative to the object (see col.6, lines 11-17). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of the Mizutani et al and Schuster et al to obtain the invention as specified in the above claims of the present invention. It would have been obvious to a skilled artisan to utilize the actuator as taught by Schuster et al into the lithographic apparatus/method of Mizutani et al for the purpose of efficiently supplying the immersion liquid to the space between the projection system and the substrate.

As to claims 25, and 32, Mizutani as modified by Schuster et al lacks to show the distance between the substrate and the barrier member being at least 50 μ m as recited in the claims. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the distance between the barrier member and the substrate as recited since it has been held that where the general conditions of a claim are disclosed in the

prior art, discovering the optimum or workable ranges involves only routine skill in the art . *In re Aller*, 105 USPQ 233.

8. Claims 23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani et al (U.S 2005/0264774 A1) in view of Lin (U.S.Pat. 6,788,477)

As to claims 23 and 27, Mizutani et al discloses an immersion lithographic projection apparatus comprising substantially all of the limitations of the instant claim except for at least one immersion liquid outlet being provided on the substrate table or at least one immersion inlet port being connected to a base frame that supports the substrate table. Lin discloses an immersion exposure apparatus where a liquid outlet (32) is on the substrate table and an inlet port (30) is connected to a base frame that supports the substrate table (see figure 2). In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Mizutani et al and Lin et al to obtain the invention as specified in claims 23 and 27 of the present invention. It would have been obvious to a skilled artisan to provide at least one inlet port and at least one outlet port on the substrate table for the purpose of supplying of new liquid and discharging of used liquid from the space between the projection lens and the substrate.

Prior Art Made of Record

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hirukawa et al (US 2005/0259234) is cited for its teachings of an immersion apparatus having the liquid supply/drainage unit (32) provided on the projection optical barrel (40) for supplying the liquid to a space between the substrate and the projection optical system.

Allowable Subject Matter

10. Claims 1, 3-13, 15-20 are allowed.
11. The following is a statement of reasons for the indication of allowable subject matter: claims 1, 3-13 and 15-20 have been found to be allowable since the prior art of record, either alone or in combination, neither discloses nor makes obvious the combination of a lithographic apparatus and corresponding method where a barrier member is provided and extending along at least a part of the boundary of a space between the substrate and the projection lens, along with at least one inlet, and at least one outlet, with particular connections among these elements, satisfying conditions as recited in the instant claims.

Response to Amendment/Argument

12. In view of Applicant's correction to the drawings, the objection to the drawing is withdrawn. Applicant's amendment filed November 30, 2005 has been entered. Claims 1, 3, 4, 8, 10-11, 13, 15, 19, 21, 25, 27, 29-30, 34 and 36 have been amended. Claims 2, 14, 26 have been cancelled. With respect to the prior art rejections, applicant's arguments have been carefully reviewed but have been traversed in view of new ground of rejections as set forth above.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Hung Henry V Nguyen
Primary Examiner
Art Unit 2851**

hvn
12/28/05